**Algebra 1B: Final Exam Practice Exam Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* 1. A friend tells you that the relationship between the height of a sunflower and the number of hours of sunlight it gets is a real-life example of an algebraic function. Do you agree or disagree?

1. First, write the definition of a *function*:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Is your friend’s example a function? (Yes/No): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. “My friend’s example \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (is/is not) an example of a function because \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Explain the main differences between a *linear* function, an *exponential* function, and a *quadratic* function

|  |  |  |
| --- | --- | --- |
| **Linear Function** | **Exponential Function** | **Quadratic Function** |

* 1. **Draw** and **explain** the difference between the **solution** to a linear equation and a **solution** to a system of linear equations. Please use correct algebraic terms when appropriate.

|  |  |
| --- | --- |
| Solution to a **linear equation** | Solution to a **SYSTEM of linear equations** |

**Directions for questions 4 – 5:** Determine whether the relationships depicted are linear or exponential. Write the equation that models each relationship, and define your variables where indicated.

* 1. A baby has just started talking. She knows ten words, but the number of words in her vocabulary is doubling every month.

**Type of function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Variables:** \_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Aaron is given $200 as a graduation gift. He spends an average of $35 per week.

**Type of function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Variables:** \_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Provide **at least two** definitions of what each variable in the slope-intercept version of a linear function represent.
  2. Determine the slope of a line that passes through the points (1, 5) and (3, 9).
  3. Write the equation of a line that passes through the points (2, -3) and (4, -7).
  4. Write the equation for the line that is parallel to and passes through the point (3, 1).
  5. Write the equation for the line that is perpendicular to and passes through the point (2, -4).
  6. Graph the following linear functions.

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* 1. Graph the following linear functions:

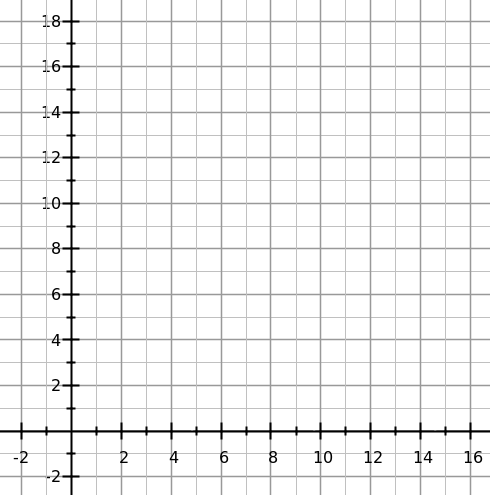
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* 1. Write the slope-intercept form equation for the following lines.

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| --- | --- |
| **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**Directions for questions 14 – 16:** Read the scenario, then complete the input-output table, graph the relationship (**label your axes)** and answer the two questions that follow.

**Scenario:** *A tree planted in front of the new gym is 8 feet tall. It grows by 2 feet each year.*



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***x*** | **0** | **1** | **2** | **3** |
| ***y*** |  |  |  |  |

* 1. What do the two variables represent?

*x* = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

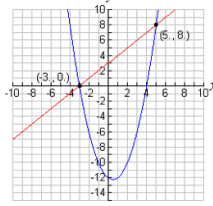
*y =* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Write the equation that represents this relationship.

**Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* 1. If the tree kept growing at the same rate, how tall would it be in 55 years?
  2. Is (3, 5) a solution to the equation ?
  3. Which of the following is a solution to the system below?

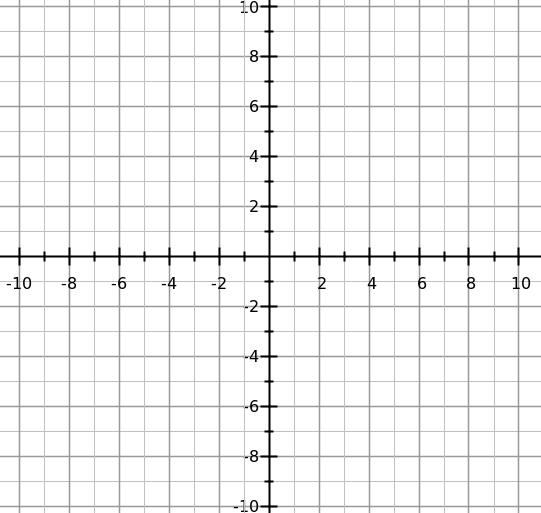
1. (1, 3)
2. (-1, -4)
3. (2, 5)
4. (3, 7)
   1. How many solutions does this system have?



1. Zero solutions.
2. One solution.
3. Two solutions.
4. Infinite solutions.
   1. Solve the following system:
   2. What are the three options for how many solutions a system of linear equations can have? Explain each of the options in the table below.

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* 1. Graph the following linear inequality. Be sure to clearly indicate whether your line is dashed or solid, and clearly shade in the solution zone.



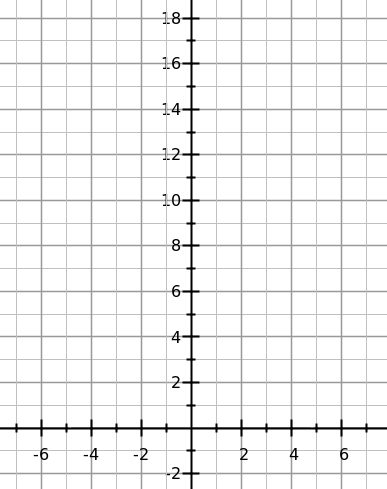
**Inequality:**

* 1. Graph to show the solutions to the following system of linear inequalities. Be sure to clearly indicate whether your line is dashed or solid, and clearly shade in the solution zone.



**System:**

1. Simplify:
2. Simplify:
3. Simplify:



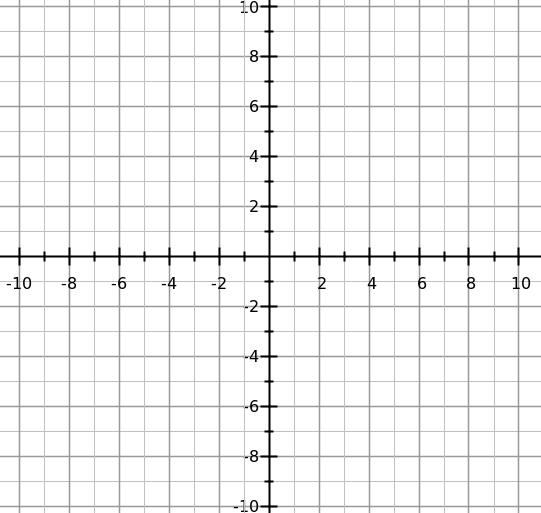
1. Complete the input-output table and graph:

|  |  |
| --- | --- |
|  |  |
| **-3** |  |
| **-2** |  |
| **-1** |  |
| **0** |  |
| **1** |  |
| **2** |  |
| **3** |  |

**Equation:**

1. At the start of 2010 there were 450 deer in Rock Creek Park. Since then, the number of deer has grown by 2% each month. How many deer were there at the start of 2012?
2. You bought your first car 5 years ago for $26,550. Since then, the value of the car has depreciated by 5% each year. How much is the car worth now?
3. Write the following polynomials in standard form and then name them.

|  |  |  |
| --- | --- | --- |
| **Original** | **Standard Form** | **Name** |
|  |  |  |
|  |  |  |
|  |  |  |

1. Add the following polynomials:
2. Multiply and write in standard form:
3. Multiply and write in standard form:
4. Multiply and write in standard form:
5. Factor completely (GCF):
6. Factor completely:
7. Factor completely:
8. Identify the features of the quadratic function
   1. Opens up or down? \_\_\_\_\_\_\_\_\_\_\_
   2. Wider or narrower than the parent quadratic? \_\_\_\_\_\_\_\_\_\_\_\_
   3. Axis of Symmetry, *x* = \_\_\_\_\_\_\_\_\_
   4. Vertex: ( \_\_\_\_\_ , \_\_\_\_\_\_ )
9. Identify the features of the quadratic function
   1. Opens up or down? \_\_\_\_\_\_\_\_\_\_\_
   2. Wider or narrower than the parent quadratic? \_\_\_\_\_\_\_\_\_\_\_\_
   3. *x-*intercepts: *x* = \_\_\_\_\_ and *x =* \_\_\_\_\_\_
   4. Axis of Symmetry, *x* = \_\_\_\_\_\_\_\_\_
   5. Vertex: ( \_\_\_\_\_ , \_\_\_\_\_\_ )
10. Graph:

Axis of Symmetry: \_\_\_\_\_\_\_

Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

*a =* \_\_\_\_\_\_\_\_\_\_\_\_\_

1. Graph:

Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

*a =* \_\_\_\_\_\_\_\_\_\_\_\_\_

1. Use the quadratic formula to solve:
2. Solve by factoring: